Mobile DSMS

A Mobile Health System to Increase the Availability of Peer-Support among Persons Living with Chronic-Non Communicable Diseases

Salys Sultan and Permanand Mohan

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“Developing countries may be experiencing the greatest cell phone impact.........In some countries the number of cell phones in use is greater than the number of people in the country.”

(Ihealthreports, 2007)
Current Situation in the Caribbean

Figure 1. Prevalence Estimates of Diabetes in Caribbean Region in 2011
(Source: Diabetes Atlas, International Diabetes Federation)
Trinidad and Tobago - Target Population

- In 2010, the rural population account for 86.10% of total population (approx 1.4 million) in Trinidad and Tobago. (World Bank, 2011)

- Communications:
  - Land line use: 293,300
  - Mobile Cellular use: 1.894 million

    (CIA Factbook, 2011)

- Reasons for high mobile phone penetration:
  - low-cost handsets
  - rollout of mobile network infrastructure and increased access
  - expansion of network coverage to rural areas
  - cost-effective pre-paid services
  - spending and gain access to flexible, low-cost voice and SMS services

    (UNICEF, 2010)
Mobile Health

- **Definition:**
  Mobile health refers to the provision of health-related services via mobile communications
  \[\textit{(mHealth Summit, 2010)}\]

- **Related Work:**
  - Quinn et al., 2011
  - Cafazzo, 2011
  - Mohan & Sultan, 2009
Peer Support & Chronic Disease Outcomes

Informational support:
- Sharing experiences and information
- Modeling effective skills

Emotional support:
- Encouragement
- Reinforcement
- Decreased sense of isolation

Mutual reciprocity:
- Shared problem solving
- Both receiving and giving help on shared medical issues

- Increased confidence (self-efficacy)
- Increased perceived social support
- Increased positive mood
- Increased understanding of self-care

Improved health-related quality of life

Improved health behaviors (e.g., weight monitoring, diet, taking medications)

Improved chronic disease control

Decreased hospitalizations and mortality

(Heisler, 2006)
Mobile DSMS

1. Mobile DSMS is based on a framework for Collaborative Disease Management using Mobile Technologies (Sultan & Mohan, 2011)
2. It allows users with similar disease management interests to virtually gather and share experiences, ask questions and provide support and problem-solve remotely through the use of mobile devices.
Mobile DSMS - Architecture
Screenshots (2)

- Glucose Readings Form
- Nutrition Form
- Current Location Form
Screenshots (3)

Select Member(s) Form

New Message Form

Add ODLs Form
In January 2012, a focus group was held to obtain preliminary feedback on the system concept and the mobile application design:

- No. of participants:
  - 21 (patients (16) caregivers (5))
- Age: 36 - 66yrs
- Gender: male (10) female (11)
- Ethnicity: afro-trinbagonian (7) indo-trinbagonian (13) mixed (1)
- No. enrolled in a support group programme: 0
Results(1)

Focus: Willingness to use the system

Responses:
- Yes, people do this now...when you discuss these things with others, it feels good
- Yes, my friends already help me ....they tell me what to eat to feel better
- Yes, people should start doing this
- Yes, there is a support group at my clinic but I cannot attend because of personal family commitments
- Not sure, not familiar with this phone
Results(2)

- Focus: Suggestions to improve the system
- Responses:
  - For persons who are vision impaired...how will this be handled?
  - Is this system available for regular (‘me-too’) phones?
  - Having access to an existing diabetes library
  - Including more community visits
  - A lot of information already provide...better to keep the system simple
  - I will like to see some interpretation of the results
Three month trial:
- 30 type II diabetics:
  - 15 experiment - receive Mobile DSMS application designed by researchers at the University
  - 15 control - receive DSMS through their primary diabetes care in a clinical setting or community setting

Objective:
- to determine the effectiveness of CDM using Mobile Technologies

Limitations of Study:
- Time period may be too short; may not obtain any observable effect in less than 2 years
- Sample size is too small; it is necessary to have a validation with a large group
- Other factors that may influence study: time of year, prior DSMS efforts etc.
Main Outcomes

Knowledge
- Did the user’s overall knowledge of the subject matter area increase?
- Diabetes knowledge questionnaire

Health Status
- Did the user’s overall health improve?
- AIC Test

Social Outcomes
- What type of community structures were formed?
  Did they feel part of a group?
- Activity Logs, Direct Observation, Focus Groups & Post User Interviews

System Usage
- What features were most effective in achieving the system’s objective?
- MT is (not) effective as a medium for delivery of health svvs
- MT svvs is (not) effective in improving PT health
- MT svvs is (not) effective in forming support groups
- MT feature(s) are (not) effective achieving objectives
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